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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 10/623,906

Filing Date: July 21, 2003

Appellant(s): CLAASSEN, FRANCISCUS GERARDUS JOHANNES

Robert Hutter  
Xerox Corporation  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed 06/04/2007 appealing from the Office action mailed 10/11/2006.

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is correct.

**(4) Status of Amendments After Final**

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

**(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(8) Evidence Relied Upon**

5,479,087	Wright	12-1995
6,370,354	Chapman et al.	4-2002

**(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 2 and 7-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wright (US 5,479,087).

Regarding claim 1, Wright discloses a power supply (108) accepting a mains voltage (110) as an input and outputting a first predetermined voltage (+12V) from a first terminal and a second predetermined voltage (+5V) from a second terminal, comprising:

a main circuit for deriving the first predetermined voltage (+12V) from the mains voltage (110);

a secondary circuit for deriving the second predetermined voltage (+5V) from the main circuit; and

a preload circuit (169) applying a preload on the main circuit as a result of the secondary circuit going out of control, the preload circuit (169) including an output directly to the second terminal.

See Fig. 3. The main circuit derives the first predetermined voltage (+12V) through a secondary winding (118) of a transformer (T3) and elements (122-138), which include filters and storage components. The secondary circuit derives the second predetermined voltage (+5V) through a secondary winding (120) of the transformer (T3) and elements (132, 142-156), which include filters and storage components.

The secondary circuit also derives the second predetermined voltage (+5V) from excess voltage in the main circuit. The preload circuit (169) draws power from the main circuit to the secondary circuit during flyback cycles of the power supply (108), as well as when the main circuit is under little or no load and a maximum load appears in the secondary circuit. See 10:47-56. It is understood that instances during which an extremely heavy or maximum load appears in the secondary circuit would cause the

secondary circuit to go out of control and that those instances would thus be characterized as instances during which the secondary circuit is going out of control.

The output of the preload circuit (169) is a source terminal of a transistor (140) practically coupled directly to the second terminal. Fig. 3 shows a filter inductor (154) between the output of the preload circuit (169) and the second terminal, which the reference says can be ignored. See 8:25-36.

Wright discloses feedback control for the secondary circuit, coupled to the second terminal. See Fig. 3 and 9:22-67. The reference does not disclose that the feedback control for the secondary circuit in Fig. 3 includes a magamp controller.

However, the reference discloses the use of a magamp controller (40) as a prior art method of regulating an output of a power supply. The magamp controller (40) is described as providing "good regulation...to maintain the output voltage within a specified voltage range under most load conditions," but "very costly." See Fig. 1B and 3:10-34. It would have been obvious to one of ordinary skill in the art at the time of the invention to replace the feedback control for the secondary circuit of Fig. 3 with the magamp controller of Fig. 1B in order to provide effective regulation of the output voltage, especially in instances where the quality of output voltage regulation offered by a magamp controller was a priority over cost effectiveness. The magamp controller would serve as a post regulator circuit to the output of the secondary circuit.

Wright discloses that the preload circuit (169) includes an output directly to the second terminal. See Fig. 3 and 8:25-36. Since the magamp controller (40) would be coupled to the second terminal when replacing the feedback control for the secondary

circuit of Fig. 3, as discussed above, the output of the preload circuit (169) would be directly coupled to the second terminal and an input from the magamp controller.

Regarding claim 2, Wright discloses that the main circuit includes a transformer (T3). See Fig. 3.

Regarding claim 7, Wright discloses that the preload circuit (169) includes a voltage-controlled current source operatively interposed between the main circuit and the secondary circuit. Since the preload circuit (169) supplies current to the secondary circuit depending on the cycling of power supply (108) as well as the voltages of the first and second terminals, the preload circuit (169) is a voltage-controlled current source.

See 10:47-56.

Regarding claim 8, Wright discloses that the voltage-controlled current source includes a transistor (140) having a base, the base of the transistor (140) being controlled by a transistor (160), which is associated with a storage inductor (130) on the first terminal, which is controlled by a storage inductor (132) on the second terminal. See Fig. 3 and 8:14-49. Thus, the base of the transistor (140) is associated with the second terminal and would be associated with the magamp controller coupled to the second terminal, as discussed above. See above rejection on claim 1.

Regarding claim 9, Wright does not disclose a zener diode operatively disposed at the base of the transistor (140) of Fig. 3.

However, the reference discloses a zener diode (96) operatively disposed between the base of a transistor (82) and a controller (70) of the transistor (82) in an alternative embodiment of the power supply. See Fig. 2 and 6:32-38. The zener diode

(96) protects the transistor (82), which operates similarly to the transistor (140) of Fig. 3, by limiting the voltage at its gate. It would have been obvious to one of ordinary skill in the art at the time of the invention to operatively dispose the zener diode of Fig. 2 between the base of the transistor of Fig. 3 and the magamp controller of the post regulated circuit in order to protect the transistor by limiting the voltage at its gate.

Regarding claim 10, it is understood that the secondary circuit goes out of control as a result of the load on the first terminal being relatively low and a load on the second terminal being relatively high. See above rejection on claim 1.

Regarding claim 11, Wright discloses that the main circuit includes a transformer (T3), and that the secondary circuit derives a second predetermined voltage (+5V) from the transformer (T3) in the main circuit. The secondary circuit derives the second predetermined voltage (+5V) at least through a secondary winding (120) of the transformer (T3) and elements (132, 142-156), which include filters and storage components. See Fig. 3.

Claims 16-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wright (US 5,479,087) in view of Chapman et al. (US 6,370,354).

Regarding claim 16, Wright discloses a power supply (108) as recited in claim 1 of the present application. See above rejection on claim 1. The power supply (108) is disclosed as being part of a computer system, not a printing apparatus.

However, Chapman et al. discloses a printing apparatus (10) comprising a motor and a printhead (20). See Fig. 1, 6:46-48, and 9:38. The reference also discloses a

power supply (312) of the printing apparatus (10) having multiple output terminals at different voltage levels for providing power to various parts of the printing apparatus (10). See Fig. 11 and 17:37-42. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the power supply (108) of Wright in the printing apparatus (10) of Chapman et al., powering the motor with one terminal of power supply and powering the printhead with the other terminal, in order to provide a highly efficient power regulation circuit for the printing apparatus.

Regarding claim 17, the magamp controller, used as a feedback mechanism in the secondary circuit, would serve as a post regulator circuit to the output of the secondary circuit of power supply (108).

Regarding claims 18-20, claims 18-20 correspond to claims 7, 10 and 11, respectively, and are therefore rejected under the same reasoning as that of those claims. See above rejections.

#### **(10) Response to Argument**

##### *The Rejection of Claims 1, 2 and 7-11 under 35 U.S.C. 103(a) as being Unpatentable over Wright*

Appellant argues that the "coupled-inductor topology" shown in Fig. 3 of Wright is utterly different from the claimed invention and that, with a coupled-inductor topology, because the two outputs share the same transformer output coil, there can be no true independence between the outputs of the main and secondary terminals. Examiner

asserts that the term "coupled inductor" as used by Wright actually refers to a multiple output switching power supply in which "all of the storage inductors of all outputs are typically wound around a single magnetic **core**." See 2:42-45. That is, in the coupled-inductor arrangement of Fig. 3, the two output inductors (130, 132) are wound around a common core; it is not the case that the two output inductors (130, 132) are one and the same coil. In response to the argument that there can be no true independence between the outputs of the main and secondary terminals in Fig. 3 of Wright, Examiner asserts that, not only is it stated in 9:7-8 that "the +12 V and the +5 V signals are isolated from each other during the forward cycle," but that "true independence between the outputs of the main and secondary terminals" is **not a limitation recited in the claims.**

Appellant argues that the feedback loop of Fig. 1B of Wright only shows magamp control of one output, whereas, claim 1, in contrast, recites an effective magamp control of both outputs. Examiner asserts that arguing this difference does not overcome the obviousness rejection for the following reasons: Wright discloses in 2:36-42 that Figs. 1A-D, which illustrate various known feedback methods, "only show one output leg or portion of a multiple output switching power supply, where each output provides a different voltage level." Thus, **Fig. 1B of Wright shows magamp control as a known feedback method in a multiple output switching power supply.** Regarding the fact that the magamp control (40) of Fig. 1B is applied to a 12 volt output, the reference provides background information to Fig. 1B by discussing in 1:47-67 and 2:1-17 a multiple output power supply with a 5 volt output and a 12 volt output, wherein the 12

volt supply may be "relatively erratic, and varies from no load at all to sudden large loads drawing large surge currents." This would constitute an "out of control" condition as claimed. This disclosure of the 12 volt supply going out of control explains why the magamp control (40) of Fig. 1B is shown as being applied to the 12 volt supply.

But Fig. 3 of Wright, which displays an embodiment of Wright's invention, is concerned with "out of control" conditions of **both** outputs. This is explained in 10:45-56, which states: "The +12 V and +5 V signals are regulated well within specifications under all expected load conditions. It has been observed that the synchronized switch 169 draws excess current, and thus power from the +12 V signal to the +5 V signal when the +12 V signal is under little or no load. **It is also true that current sharing occurs in the opposite direction when loading conditions are reversed. In particular, when the load between the +5 V signal and GND is relatively light and maximum load appears between the +12 V signal and ground, excess current and power from the +5 V signal is provided to the +12 V signal during the flyback portion** through the MOSFET 140." Since Fig. 1B shows a magamp feedback control of an output that may go "out of control," and Fig. 3 shows the secondary circuit having a +5 V output at risk of going "out of control," it would have been obvious to one of ordinary skill in the art at the time of the invention to replace the feedback control of the secondary circuit of Fig. 3 with the magamp control of Fig. 1B in order to provide effective regulation of the secondary output voltage. The magamp controller would input to the preload circuit (169), just as the feedback circuit of Fig. 3 affects the preload circuit (169).

Appellant argues that, by presenting the Fig. 3 embodiment as superior to the magamp arrangement of Fig. 1B, Wright teaches away from the use of a magamp for controlling both outputs. However, Examiner asserts that the reference describes the magamp controller (40) of Fig. 1B as providing "good regulation...to maintain the output voltage within a specified voltage range under most load conditions," but "very costly." See 3:10-34. Thus, Wright merely suggests that the feedback arrangement of Fig. 3 would be less costly than the magamp controller (40) of Fig. 1B, and it would have been obvious to one of ordinary skill in the art at the time of the invention to replace the feedback control for the secondary circuit of Fig. 3 with the magamp controller of Fig. 1B in order to provide effective regulation of the output voltage **in instances where the quality of output voltage regulation offered by a magamp controller was a priority over cost effectiveness.** The benefits of using a magamp controller are clear from the disclosure of the reference, and so the presentation of the Fig. 3 embodiment does not teach away from the use of magamp control.

Appellant argues that using a magamp control to affect both outputs is not disclosed or suggested by Wright. Examiner asserts that, since both outputs of Fig. 3 may go "out of control" as indicated in 10:45-56 and discussed above, one would be motivated to replace the feedback control shown in Fig. 3 with magamp control **to affect both of the outputs, thereby regulating both output voltages.** Note that this would be assisted by preload circuit (169), which applies a preload on the main circuit as a result of the secondary circuit going out of control **and vice versa.**

Appellant argues that neither Fig. 1B nor Fig. 3 of Wright suggests applying a preload on the main circuit **as a result of** the secondary circuit going out of control. Examiner asserts that the reference clearly discloses in 10:47-56, with respect to Fig. 3, that the preload circuit (169) **draws power from the +12 V main circuit** to the +5 V secondary circuit **when** the +12 V main circuit is under little or no load and a **maximum load appears in the +5 V secondary circuit**. It is understood that instances during which an extremely heavy or maximum load appears in the +5 V secondary circuit would cause the +5 V secondary circuit to go “out of control” and that those instances would thus be characterized as instances during which the +5 V secondary circuit is going “out of control.”

The Rejection of Claims 16-20 under 35 U.S.C. 103(a) as being Unpatentable over Wright in view of Chapman et al.

Appellant argues that claim 16 includes the limitations of claim 1. See above response to argument regarding Wright.

**(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner’s answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Application/Control Number:  
10/623,906  
Art Unit: 2836

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